South Delta Fish Facilities Forum

Meeting Summary and Action Items
May 16, 2003, 9:00 - Noon
California Bay-Delta Authority, Bay-Delta Room
Sacramento, California 95814

Attendees

Kirk Rodgers	USBR (Forum Co-Chair)
Tim Quinn	MWDSC (Forum Co-Chair)
Diana Jacobs	DFG (Forum Co-Chair)

Tina Swanson	Bay Institute
Ron Ott, Darryl Hayes, Zach Hymanson	CBDA
Red Bartley, McWhitey Rassmussen	CSBA
John Beuttler	CSPA
Serge Birk	CVPWA
John Winther	Delta Wetlands
Perry Herrgesell, Bob Fugimura, Jerry Morinaka, Kevin Fleming	DFG
Kathy Kelly, Don Kurosaka, Barbara McDonnell	DWR
David Nesmith	EWC
Doug Lovell, Mike McKenzie	FFF (Federation of Fly Fishers)
Rick Sitts, Jim Buell, Dennis Majors	MWDSC
Dan Odenweller, Diane Windham, Bruce Oppenheim	NMFS
Dan Nelson, B.J. Miller	SLDMWA
Gwyn Mohr Tully	SKS
Terry Erlewine, Laura King Moon	SWC
Bob Strickland	United Anglers
Ron Silva, Charles Liston, Mark Bowen, Ken Lentz	USBR
Dave Harlow, Ryan Olah	USFWS
Jon Burau, Pete Smith	USGS

Agenda

Introductions	All
Agenda Review	Dianna Jacobs
Announcements	All
Delta Smelt in the Delta	Kevin Fleming
Delta Smelt in the SDFF	Jerry Morinaka
CHTR Studies for Delta Smelt	Bob Fujimura
Process for Evaluation of SDFF Concepts	Ron Ott
Next Meeting	Dianna Jacobs

Note: Handouts and presentation materials from this meeting and previous ones are located on the CBDA website under the Conveyance Program:

http://calwater.ca.gov/Programs/Conveyance/SDFF/SouthDeltaFishFacilitesForum.shtml

Agenda Review

The Forum is trying to address what we know and do not know about SWP/CVP diversion impacts, both direct and indirect. This SDFF Forum meeting is focused on delta smelt. There were no changes to the agenda.

Agenda items for future meetings will be discussed after the June 19-20 Science Symposium (Environmental and Ecological Effects of Proposed Changes in Water Operations at CSU, Sacramento). The SDFF will not meet in June due to this.

Announcements

Upcoming Science workshops:

July 15 - 16, 2003: Annual EWA Salmonid Workshop

August 18, 2003: Annual EWA Delta Smelt Workshop

Delta Smelt in the Delta

Kevin Fleming gave a PowerPoint presentation on the state of knowledge we have on delta smelt, including monitoring, distribution, life history, populations, species and habitat interactions, and controversies. The full presentation is available on the CBDA website as referenced above. Key points of his talk and discussion comments that have impacts on South Delta operations were as follows:

- Delta smelt typically live in the Suisun Marsh areas and move upstream into the Delta in the Spring to spawn;
- Delta smelt are thought to spawn on firm substrates, but biologists have yet to find evidence of eggs in the wild. The eggs attach to the substrate;
- Finding ripe adults has not equated to finding juvenile fish in an area;
- The population of delta smelt is unknown, but the “Fall Midwater Trawl” and the “20mm Townet Survey” are used to describe their abundance and population indices. Those surveys have been conducted since the 1960’s and indicate population trends;
- There is some disagreement with scientists on whether delta smelt are density dependant, or density independent (i.e. is there a limit to how many smelt can the delta handle before they start to compete for survival with each other due to limited resources). Basically, most think that it is unlikely that this occurs, especially in low abundance years. The problem is that the interpretation of this is driven by a couple of data points;
- If temperatures are cooler in the Spring spawning period, a protracted spawning window can result with multiple spawning periods (cohorts). Multiple cohorts have a much better chance of at least one of the cohorts surviving. Due to their short life history (1-2 years), survival is critical;
- Basically, high outflow years with protracted cool spring temperatures mean more DS abundance;
- Recovery criteria for DS was met, but has since declined to low numbers;

- Delta smelt distribution varies seasonally and annually. The lower estuary boundary follows a salinity boundary of 1000; the distribution of spawners does not equate to equal larval distribution; and the upper delta boundary is bounded by temperature;
- Delta smelt are generally found in temperatures between 15-22 degrees C. Upper lethal tolerance is 25-27 degrees C;
- Delta smelt may be vulnerable to the over 2200 delta agricultural diversions since post-larval fish are typically found between 50-70km upstream of the confluence following VAMP (May 15). Many diversions are operating during this period. However, an intake study at Horseshoe bend found fish in the channel, but not in the diversion. Not sure if this is the case in the South Delta diversions;
- Delta smelt are typically found in the open channel areas verses open or edge habitat;
- Smelt begin to show up at the SWP/CVP fish facilities when they are at about 15mm. They hatch at 5-6mm, but probably stay near the channel bottom until they grow some. There is not a good estimate of larval abundance;
- The existing SWP/CVP fish facilities do not count fish until they reach at least 20mm;
- Reducing delta smelt entrainment at the SWP/CVP fish facilities is accomplished by reducing deliveries when fish densities are nearing the pumps. EWA water has been used to compensate for this in the past. Better monitoring may be needed to detect movements, especially at earlier lifestages to better predict movements;
- Roughly a quarter of the DS population may be lost at the pumps on average. Significance of this is of some controversy. If there was a density dependence relationship, the fish facilities could remove this relationship by summer;
- Highest YOY salvage was in 1988;
- The existing fish facilities are a poor measure of loss, since salvage efficiencies are highly variable and smaller fish (<20mm) are not counted;
- Unclear if it is better to design new facilities to salvage small fish or to deal with small fish operationally?

Action Items:

None

<u>Delta Smelt in the South Delta Fish Facilities</u>

Jerry Morinaka made a presentation on the delta smelt studies and issues at the existing South Delta fish facilities. The full presentation can be located on the CALFED website as referenced earlier. Key points and discussion items are presented below:

What we know relative to fish facilities:

- We know that delta smelt to some degree survive the fish salvage operations at the TFCF and the SDFPF;
- We know through established methods that delta smelt can be handled without causing injury or death;

- We know that delta smelt can be successfully passed through specific types of pumps unharmed;
- We know that delta smelt can now be successfully cultured;
- We also know that fish can survive specific hydraulics near fish screens from UC Davis Fish Treadmill work;

What we do not know:

- We don't know how much predation occurs on delta smelt within the fish salvage operations at the TFCF and the SDFPF
- We don't know what the efficiencies are for delta smelt for the primary louver systems at the TFCF and SDFPF
- We don't know the survival rates of delta smelt that are transported and released at the SWP and CVP fish release sites

Other points:

- Expanded salvage is used to calculate loss and is based on subsample. Counts are taken every two hours and when pumping flow rates change. These counts may underrepresent losses;
- Pulses of delta smelt come in at dusk and may be missed in counts;
- Very few adults are seen in counts. Fish under 20 mm are not counted, but there are many smaller fish entrained (15-20 mm);
- Louver efficiency of <25mm fish is very low. Louver efficiency tests at USBR secondary louvers on 60 mm (+-) delta smelt is around 65%. If efficiency at primary louvers was similar, louver efficiency for facility would be 42%. It is likely worse due to poor hydraulics and longer screen length on primary section;
- Fish entrainment tests behind the new screens at the CCWD Old River intake have not collected juvenile delta smelt (or other species as well);
- Trucking studies have been conducted by DFG in 1984-5, 1995, 1999-2000. Basically, survival is good when temperatures are 56-57 degrees F.
- Salt and oxygen were added to transport operations to increase survival in 1980's. In 1993, additional recommendations on water quality treatment from UC Davis for delta smelt;
- Water to water transfer of fish is best;
- The USBR put a Hidrostahl pump in USBR Tracy bypass/holding tank and pumped fish to above ground holding tank. Survival was over 99% indicating they can survive "fish friendly" pumping.

Action Items:

- ***None***

<u>Collection, Handling, Transportation, and Release (CHTR) Studies for Delta Smelt</u>

Bob Fujimura presented a summary of the proposed CHTR studies that will be conducted under IEP. The PowerPoint presentation is available on the CALFED Website as referenced earlier. Key points and discussion items follow:

- CHTR studies are designed to look at the "end" of the process and determine how our existing and proposed new facilities can deal with delta smelt. The CHTR is a comprehensive effort, looking at CHTR impacts. These impacts may be defined as "significant", "persistent", or "cumulative";
- SDFF entrainment can be a significant proportion of the population of juvenile DS in some years;
- DS is a relatively sensitive fish to screening and handling;
- New screens will increase the number of DS salvaged. Limited data suggests that adult DS may survival in high %; however, there is conflicting and limited data on overall survival of juvenile DS in CHTR;
- There is a focus on DS in the CHTR because: reducing fish losses associated with SD water exports is a high priority action; new fish screens and salvage facilities designed to protect DS are expensive; salvaging and transporting fish to release sites is necessary; and CHTR is considered a stressful environment due to crowding fish to high densities for transport. Our knowledge is also weak in this area;
- Data on what drives fish survival will be collected including: biology, environmental factors, stressor mechanisms, fish's response, etc.
- Five study elements will be conducted in parallel:
    - Acute mortality and injury rates of DS exposed to CHTR;
    - Fish predation in CHTR;
    - Diagnostic indicators to predict adverse effects on salvaged DS;
    - New technologies feasibility study;
    - Pilot testing and evaluation of promising CHTR concepts
- If new information can be applied soon, it will. This information will support an evaluation plan to address the role of CHTR investigations in the decision to build new SD fish screens;
- Participants in the program include: DFG CVBDB, DFG Biometrics, DWR Fish Facilities Program, USBR Denver Research Team, USBR Tracy Research Team, UCD Delta Smelt Aquaculture Project, UCD Fish Physiology Program, DWR Division of Engineering, DWR Delta Field Division, MWH Engineering (DWR Contract), California Bay Delta Authority, CVFFRT, Other Management or Technical Advisory Teams;
- The current CHTR process is based on technology over 40 years old. It is expected that new CHTR methods or strategies can improve the survival of salvaged fish. To determine the general potential of new technologies to improve the survival of salvaged DS, we need to determine the feasibility of new concepts;

- The USBR has been experimenting with several new technologies (holding tank designs with debris removal, lift systems, and fish sorting) that will be incorporated into the CHTR effort.
- The current program status is that work plans are being prepared for submission to IEP management and technical teams for final review. Programmatic approval is expected in this summer. Final reports and recommendations are planned for the first half of 2006;

Discussion Items:

- There was some concern that a focus on delta smelt is neglecting the needs of other fish. CVPIA says that other fish are as important. The consensus of the group was that the focus will be on the weakest link fish since that could drive the facility costs and operation. Data on other fish collected in tests will be included in the data set;
- Will facility decisions be delta smelt driven? Possibly, but facility decisions will include information from CHTR as well as other studies and impacts;
- Will information from CHTR be available before 8500 South Delta decisions? Not likely, but information should be available for 10,300 improvements;
- If there is decision to not pursue the 10,300 SDIP after 8500, will fish facilities commitments still be upheld (developed and implemented)? This is unclear; however, the CVPIA mandate at Tracy and the fact that facilities are aging may force some changes regardless;
- It was suggested that the aquaculture industry be consulted on handling practices as part of the effort;

Action Items:

- ***The SDFF Forum will continue dialog on technical issues to understand South Delta Facility impacts (near and far field). No major decision should be made until the group understands the issues. The SDFF Forum should also focus on what type of facility is appropriate. Politics should not dominate the SDFF Forum process.***

<u>Suggested Agenda Items for Future Meetings (running list):</u>

Predation in South Delta Channels (salmon) – What we know/don't know.

Mortality in the Delta – Discussion of USFWS release studies showing central Delta losses and possible discussion on conceptual models being investigated.

Population Significance – Discuss limitation of studies and their meaning as was recently presented at a workshop. This may be a future meeting agenda.

Biological Opinions (OCAP/SDIP)– Information on facilities that will be used in developing these. The SDFF Forum may be a good place to share

Integration of SDIP and Screens – A discussion on how the barriers could influence the salvage operations.

DWR/USBR/USGS South Delta Hydrodynamics and Fisheries Concept Proposal. A better understanding of the South Delta is under consideration and would relate to questions that the SDFF Forum is interested in.

Incidental Take -- What is reasonable?

CVFFRT and IEP MT Tools – results of discussion by these teams on ideas and on-going/past investigations that could help address SDFF issues.

Next Meeting

July 18, 2003, 2 – 5 PM

Location: California Bay-Delta Authority Office
650 Capitol Mall, 5th Floor
Bay-Delta Room